

A severe complication of pulmonary vein angiography

Sir,

Recently (Alpert, B. S., and Culham, J. A. G., 1979, *British Heart Journal*, 41, 727-729), we reported a near-fatal complication of a pressure injection pulmonary venous angiogram. We suggested that extravasation might be avoided by the use of an end-hole catheter in the wedge position, slow flow rate of contrast, and low-pressure injection. Since our initial experience with a pressure injection, we have used end-hole balloon catheters exclusively. We have used 0.3 to 0.4 ml per kg contrast at a flow rate of 2 ml/s. The pressures achieved have not exceeded 300 psi. Despite these precautions and generally excellent results, we have again produced an extensive extravasation in one of our smaller patients, a 4.4 kg 4-month-old boy. In this patient, contrast medium appeared also in both main bronchi.

Although we do not know the pressure required to rupture a pulmonary capillary or venous bed, we

suggest that even at slow flow rates (2 ml/s) critical pressure may be exceeded when the cross-sectional area of the vascular bed subtended is small. At present we are trying to evaluate the use of graded flow rates with lower flow rates in smaller patients. Ideally, we would like to be able to recommend a flow rate which allows diagnostic visualisation but does not produce life-threatening complications. As yet, we do not have enough data to do so.

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